Technical Appendix 1

Technical Appendix 1 Table 1. Foodborne disease outbreaks reported to CDC, 1998–2008. Shaded area indicates the categories of outbreaks (N=4,887) included in this analysis. Of these, 298 outbreaks were not included in analysis because information about the vehicle was insufficient to categorize the ingredient commodities.

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<th>Etiologic Agent</th>
<th>Confirmed</th>
<th>Illnesses</th>
<th>Suspected</th>
<th>Illnesses</th>
<th>Food vehicle</th>
<th>Unidentified</th>
<th>Illnesses</th>
<th>Outbreaks</th>
<th>Illnesses</th>
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<td>No. (%)</td>
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<td>73,103 (68)</td>
<td>1,235 (28)</td>
<td>27,145 (49)</td>
<td>1,908 (34)</td>
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<td>5,004 (37)</td>
<td>155,117 (57)</td>
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<td>16,247 (15)</td>
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<td>Multiple</td>
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<td>367 (3)</td>
<td>8,293 (3)</td>
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<td>Unidentified</td>
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<td>36,369 (33)</td>
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### Table 2. The number of foodborne disease outbreaks, with simple or complex implicated food vehicles, 1998–2008, and the estimated annual number of illnesses, hospitalizations, and deaths, by etiology

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<th>Elaborative Agent</th>
<th>Reported Outbreaks</th>
<th>Reported outbreak-associated illnesses</th>
<th>Estimated Annual Numbers*</th>
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The values not previously published were estimated as described in methods.

† Hosp=Hospitalizations, STEC=Shiga toxin-producing Escherichia coli, ETEC=Eнтерotoxigenic Escherichia coli, other= diarrheagenic other than STEC and ETEC

Technical Appendix Table 3. Minimum and maximum percentages of annual U.S. foodborne illnesses caused by each agent that were attributed to each food commodity, by etiologic agent, using outbreak data from 1998 through 2008

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<th>Mollusks</th>
<th>Dairy</th>
<th>Eggs</th>
<th>Beef</th>
<th>Game</th>
<th>Pork</th>
<th>Poultry</th>
<th>Grains-B</th>
<th>Beans</th>
<th>Oils-S</th>
<th>Sugars</th>
<th>Fruits-N</th>
<th>Fungi</th>
<th>Leaky</th>
<th>Root</th>
<th>Sprout</th>
<th>Vine-Stalk</th>
<th>Total</th>
<th>Simple food</th>
<th>Complex food</th>
<th>Total</th>
<th>Simple food</th>
<th>Complex food</th>
<th>Illnesses</th>
<th>Hosp †</th>
<th>Deaths</th>
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Reported Outbreaks

Reported outbreak-associated illnesses

Estimated Annual Numbers

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STEC=Shiga toxin-producing Escherichia coli; ETEC=Enterotoxigenic Escherichia coli; other=diarrheagenic E. coli; other than STEC and ETEC; ser-=serotype.

Technical Appendix 1 Table 4. Number of foodborne disease outbreaks that were attributed to each food commodity, by etiologic agent, using outbreak data from 1998 through 2008.
<table>
<thead>
<tr>
<th>Etiologic agent</th>
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<th>Land animals</th>
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<th>Plants</th>
<th>Produce</th>
<th>Vegetables</th>
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<td></td>
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<td>V. spp., other</td>
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| STEC=Shiga toxin-producing Escherichia coli; ETEC=Enterotoxigenic Escherichia coli; other=diarrheagenic E. coli other than STEC and ETEC; ser.=serotype. |
Technical Appendix 1 Table 5. Comparison of rank order of illnesses, hospitalizations, and deaths attributed to food commodities when adjusting the attribution algorithm to account for variation among the number of outbreak illnesses.

A) Comparison of rank order and percentage of illnesses attributed to food commodities when adjusting the attribution algorithm to account for variation among the number of outbreak illnesses.

<table>
<thead>
<tr>
<th>Commodity</th>
<th>All Outbreaks, all illnesses</th>
<th>Small Outbreaks, 2–19 illnesses per outbreak</th>
<th>Medium Outbreaks, 10–100 illnesses per outbreak</th>
<th>Large Outbreaks, &gt;20 illnesses per outbreak</th>
<th>All Outbreaks, 1 illness per outbreak</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
</tr>
<tr>
<td>Leafy</td>
<td>2</td>
<td>22.3%</td>
<td>1</td>
<td>20.5%</td>
<td>1</td>
</tr>
<tr>
<td>Dairy</td>
<td>2</td>
<td>13.8%</td>
<td>3</td>
<td>11.5%</td>
<td>4</td>
</tr>
<tr>
<td>Fruits-Nuts</td>
<td>3</td>
<td>11.7%</td>
<td>6</td>
<td>7.0%</td>
<td>2</td>
</tr>
<tr>
<td>Poultry</td>
<td>4</td>
<td>9.8%</td>
<td>2</td>
<td>14.4%</td>
<td>3</td>
</tr>
<tr>
<td>Vine</td>
<td>5</td>
<td>7.9%</td>
<td>9</td>
<td>5.3%</td>
<td>8</td>
</tr>
<tr>
<td>Beef</td>
<td>6</td>
<td>6.6%</td>
<td>4</td>
<td>8.3%</td>
<td>5</td>
</tr>
<tr>
<td>Eggs</td>
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<td>6.0%</td>
<td>8</td>
<td>5.5%</td>
<td>6</td>
</tr>
<tr>
<td>Pork</td>
<td>8</td>
<td>5.4%</td>
<td>7</td>
<td>6.6%</td>
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<tr>
<td>Grains-Beans</td>
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<td>4.5%</td>
<td>5</td>
<td>7.9%</td>
<td>9</td>
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<tr>
<td>Root</td>
<td>10</td>
<td>3.6%</td>
<td>11</td>
<td>3.2%</td>
<td>10</td>
</tr>
<tr>
<td>Mollusk</td>
<td>11</td>
<td>3.0%</td>
<td>10</td>
<td>3.5%</td>
<td>13</td>
</tr>
<tr>
<td>Fish</td>
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<td>12</td>
<td>2.3%</td>
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<tr>
<td>Underdetermined</td>
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<td>13</td>
<td>1.8%</td>
<td>11</td>
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<tr>
<td>Oils-Sugars</td>
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<td>0.7%</td>
<td>14</td>
<td>0.8%</td>
<td>14</td>
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<td>Sprout</td>
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<tr>
<td>Fungi</td>
<td>18</td>
<td>0.1%</td>
<td>18</td>
<td>0.2%</td>
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</tr>
</tbody>
</table>

*4,589 Outbreaks; 120,321 illnesses
†3,126 Outbreaks; 21,701 illnesses
‡2,244 Outbreaks; 80,368 illnesses
§1,463 Outbreaks; 96,620 illnesses
¶Each outbreak adjusted to count only one illness per outbreak, which is equivalent to modeling attribution based on outbreak counts. Further discussion of attribution models based on outbreak counts versus outbreak illnesses can be found in Technical Appendix 2 (wwwnc.cdc.gov/EID/article/19/3/11-1866-Techapp2.pdf).
B) Comparison of rank order of hospitalizations attributed to food commodities when adjusting the attribution algorithm to account for variation among the number of outbreak illnesses.

<table>
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<tr>
<th>Commodity</th>
<th>All Outbreaks, all illnesses</th>
<th>Small Outbreaks, 2–19 illnesses</th>
<th>Medium Outbreaks, 10–100 illnesses</th>
<th>Large Outbreaks, &gt;200 illnesses</th>
<th>All Outbreaks, 1 illness per outbreak</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
<td>Rank %</td>
</tr>
<tr>
<td>Dairy</td>
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<td>2 15.3</td>
<td>3 13.0</td>
<td>4 11.6</td>
<td>5 14.8</td>
</tr>
<tr>
<td>Leafy</td>
<td>1 13.5</td>
<td>2 13.0</td>
<td>3 14.2</td>
<td>4 13.7</td>
<td>5 13.4</td>
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<tr>
<td>Poultry</td>
<td>3 11.5</td>
<td>4 17.8</td>
<td>2 13.5</td>
<td>3 11.4</td>
<td>1 17.0</td>
</tr>
<tr>
<td>Vine</td>
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<td>8 5.3</td>
<td>5 7.5</td>
<td>5 11.2</td>
<td>7 4.8</td>
</tr>
<tr>
<td>Fruits-Nuts</td>
<td>5 10.1</td>
<td>9 5.3</td>
<td>4 9.7</td>
<td>6 10.2</td>
<td>5 8.1</td>
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<td>5 8.5</td>
<td>7 9.7</td>
<td>6 10.2</td>
<td>5 8.1</td>
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<td>Eggs</td>
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<td>4 8.5</td>
<td>6 7.9</td>
<td>7 7.0</td>
<td>4 8.3</td>
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<td>6 6.6</td>
<td>7 6.9</td>
<td>9 4.8</td>
<td>6 7.1</td>
</tr>
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<td>Pork</td>
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<td>7 6.1</td>
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<td>8 5.0</td>
<td>8 6.2</td>
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<tr>
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<td>10 4.0</td>
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<td>12 2.7</td>
</tr>
<tr>
<td>Grains-Beans</td>
<td>12 2.5</td>
<td>10 3.4</td>
<td>11 2.6</td>
<td>12 2.1</td>
<td>10 3.0</td>
</tr>
<tr>
<td>Mollusk</td>
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<td>13 2.3</td>
<td>14 0.6</td>
<td>13 1.7</td>
<td>13 2.8</td>
</tr>
<tr>
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<td>15 0.7</td>
<td>13 1.7</td>
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<tr>
<td>Oils-Sugars</td>
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<td>15 0.4</td>
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<td>17 0.4</td>
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<td>14 0.5</td>
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<td>15 0.5</td>
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</table>

*4,589 Outbreaks; 120,321 illnesses
†3,128 Outbreaks; 21,701 illnesses
‡2,244 Outbreaks; 80,368 illnesses
§1,463 Outbreaks; 98,620 illnesses
¶4,589 Outbreaks
#Each outbreak adjusted to count only one illness per outbreak, which is equivalent to modeling attribution based on outbreak counts. Further discussion of attribution models based on outbreak counts versus outbreak illnesses can be found in Technical Appendix 2 (wwwnc.cdc.gov/EID/article/19/3/11-1866-Techapp2.pdf).
C) Comparison of rank order of deaths attributed to food commodities when adjusting the attribution algorithm to account for variation among the number of outbreak illnesses.

<table>
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<th>Medium Outbreaks, 10-100 illnesses per outbreak</th>
<th>Large Outbreaks, &gt;20 illnesses per outbreak</th>
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*4,589 Outbreaks; 120,321 illnesses
†3,126 Outbreaks; 21,701 illnesses
‡2,244 Outbreaks; 80,368 illnesses
§1,463 Outbreaks; 98,620 illnesses
¶4,589 Outbreaks
#Each outbreak adjusted to count only one illness per outbreak, which is equivalent to modeling attribution based on outbreak counts. Further discussion of attribution models based on outbreak counts versus outbreak illnesses can be found in Technical Appendix 2 (wwwnc.cdc.gov/EID/article/19/3/11-1866-Techapp2.pdf).